

COMPONENTS

FAQ

Q What is DirectX 10, and will it work with my current graphics card?

A DirectX is Microsoft's graphics engine, which games developers use to create games. It defines a set of controls that are used to create the 3D worlds and effects you see in most modern games.

Previously, all versions of DirectX were backwards-compatible. For DirectX 10, though, Microsoft removed the backwards compatibility to allow a bigger change in the technology. It has introduced new features, including a geometry shader that allows more complex effects to be generated in real time.

To run DirectX 10 games, you'll need hardware that supports the technology, such as Nvidia's GeForce 8800GTX graphics card. But the large number of incompatible graphics cards in PCs means the first set of DirectX 10 games are likely to ship with separate DirectX 9 versions.

David Ludlow
Reviews Editor



david@computershopper.co.uk

POWERCOLOR X1950 Pro

★★★★★

£153 inc VAT



ATI's Radeon X1900 XT has been our recommended graphics card for a while. With its reasonable price and excellent performance, it's capable of running games at high resolutions. ATI plans to go one better with its Radeon X1950 Pro, designed to offer similar performance for a lot less money.

We have one of the first cards to use this graphics chip, PowerColor's X1950 Pro. We reviewed the 256MB version, but there's also a 512MB version of the card, which costs £183 including VAT. Rather than use the standard reference design, PowerColor decided to use an Artic Cooling heatsink and fan, which run almost silently. It's not suitable for all cases; the heatsink bulges over the side of the card, so you'll have trouble installing it in a mini case. The card also takes up two slots, so you need to take this into account before you buy.

Rather than using the newer GDDR4 memory ATI has started using on its high-end X1950 XTX graphics cards, the X1950 Pro uses standard GDDR3 memory. Its specifications are still good, though, with a core speed of 600MHz, 36 pixel pipelines and its memory clocked at 700MHz (1.4GHz). This card's specifications are a little behind the X1900 XT, but gaming performance is what really counts.

As you can see from our results, the X1950 Pro did exceptionally well in all our tests and the Call of Duty 2 results are particularly impressive. To see how it coped with higher resolutions, we upped our Call of Duty 2 test to 1,600x1,200 and ran it again. The score of 29.6fps shows this card can cope with modern games at higher detail settings. Furthermore, the



card scored slightly higher than PowerColor's X1900 XT. The Doom 3 performance is good, but lags behind the scores achieved by Nvidia-based graphics cards; this game uses OpenGL, and ATI's drivers aren't as good as Nvidia's with this technology.

The X1950 Pro is CrossFire-capable, but it uses the new internal connector that uses two adaptors to join the card to another in a similar way to SLI. This is neater, because you don't have the mess of cables hanging out the back of your case. It's also easier to upgrade, as you don't need a CrossFire master card; as with SLI, any two matching ATI cards with an internal CrossFire connector will do. One thing PowerColor's X1950 Pro doesn't have is support for DirectX 10. This is unlikely to be a problem for the next year, though, as all new games have support for DirectX 9.

At least as quick as the Radeon X1900 XT but a lot cheaper, PowerColor's X1950 Pro is the best graphics card you can buy if you want fast graphics on a reasonable budget.

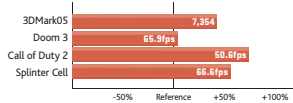
David Ludlow

SUMMARY

- ✓ Incredibly quick
- ✓ Excellent value
- ✓ Internal CrossFire connector

GRAPHICS CARD ATI Radeon X1950 Pro, PCI-E x16 interface, 36 pixel pipelines, 256MB GDDR3 memory running at 700MHz (1.4GHz effective), 600MHz core speed, two DVI, TV-out
PART CODE X1950PRO 256Mb VIVO
SUPPLIER www.overclockers.co.uk
DETAILS www.powercolor.com.tw

PERFORMANCE (see page 56)



Also consider...

INTEL Core 2 Duo E6700

★★★★★

£343 inc VAT

PRICE CUT!



Intel's new processor is based on the company's mobile technology. It is designed to be much more efficient than the P4. It's incredibly quick, achieving some of the highest benchmark results we've ever seen. You'll need a new Intel 965 or 975-based motherboard to use the E6700, but it's worth every penny, as it's by far the best-value processor you can buy.



PROCESSOR Two cores running at 2.66GHz, LGA775, 267MHz external bus, 4MB L2 cache PART CODE BX805576700
SUPPLIER www.dabs.com DETAILS www.intel.com

✓ Extremely fast, Great value FULL REVIEW Oct 2006

FOXCONN GeForce 7950GT

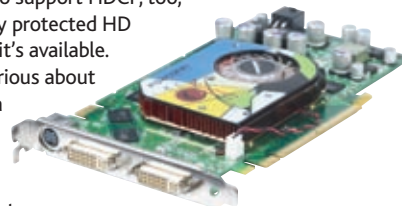
★★★★★

£193 inc VAT



Foxconn's GeForce 7950GT is good value and it's quick in games, too – it scored 41.3fps in our Call of Duty 2 test. It's the first Nvidia graphics card to support HDCP, too, so you can play protected HD content when it's available.

If you're serious about games, this is a good choice of card and it comes with a USB game pad, too.



GRAPHICS CARD Nvidia GeForce 7950GT chipset, 512MB GDDR3 RAM, PCI Express x16 interface PART CODE VIDFOX7950GT512
SUPPLIER www.microdirect.co.uk DETAILS www.foxconnchannel.com

✓ Fast; good bundle ✗ Not as quick as an X1900XT
FULL REVIEW Jan 2007

FOXCONN

GeForce 8800 GTX

★★★★★

£450 inc VAT



ATI's graphics cards have been on top for a while, so Nvidia needed to produce something special. It has more than done this with its GeForce 8800 GTX graphics chip, which we see for the first time on Foxconn's graphics card of the same name.

This is the first graphics card we've seen to support DirectX 10, which will be released with Windows Vista. This is a major update to Microsoft's graphics engine, such that DirectX 10 games won't run on older hardware; see the FAQ opposite. In the short term, due to existing hardware, it's likely to mean new titles ship with a DirectX 9 version, but in the long term you'll have to upgrade to play the latest games.

Nvidia has redesigned its hardware. The GeForce 8800 GTX has no pixel pipelines, replacing them with 128 stream processors running at 1.35GHz. The big difference here is that the stream processors are flexible and can be dynamically assigned different operations including pixel, vertex, geometry or physics.

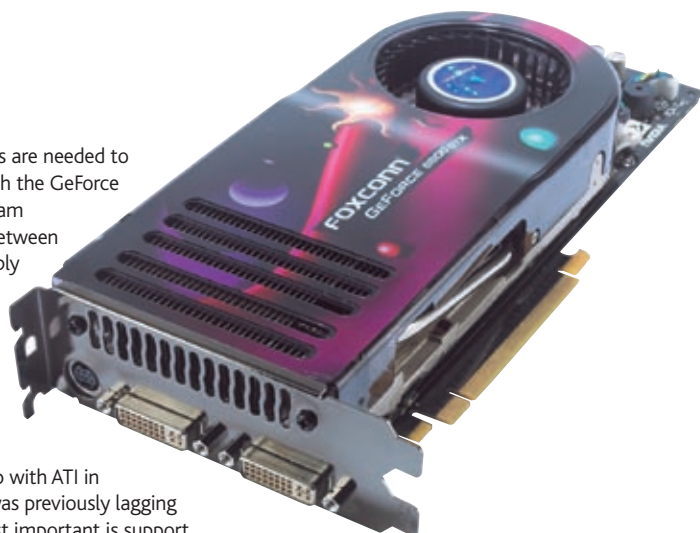
The older GeForce cards had an unbalanced architecture with more pixel pipelines than vertex pipelines. With this older architecture, generating indoor scenes was easy, as there were few vertices needed to create the room, but a lot of shading to do. However, step outside into wide landscape, such as a mountain range, and the tables are turned; lots

of geometry and vertices are needed to generate the terrain. With the GeForce 8800 GTX's flexible stream processors, the switch between inside and out is incredibly easy. The stream processors don't just have to be used for graphics, though. They can be used for other operations such as physics in games.

Nvidia has caught up with ATI in specific areas where it was previously lagging behind. Perhaps the most important is support for anti-aliasing and high dynamic range (HDR) rendering at the same time, which games such as *The Elder Scrolls IV: Oblivion* use. There's the inevitable increase in memory, with the 8800 GTX packing a massive 768MB of GDDR3. It's

surprising to see GDDR4 memory hasn't been used, but Nvidia has increased memory bandwidth by clocking its memory to 900MHz (1.8GHz) and using a wide 385-bit memory controller, up from 256-bits on the older cards.

Graphics performance was absolutely stunning. The card stormed through all our regular tests at a resolution of 1,280x1,024. Upping the resolution to 1,600x1,200 had little effect on the performance; in fact, *Call of Duty 2* got a slightly faster frame rate with 68.9fps. It's a similar story with widescreen monitors, so you can play at your display's



native resolution no matter what its size. Should you need it, the 8800 GTX also supports SLI mode. It requires two SLI connectors, as a single connector no longer provides enough bandwidth.

While the graphics performance is the best we've ever seen, there are some things to watch out for. First, the card is huge and takes up two slots, so you won't be able to get it inside a small case. Second, it requires two PCI-E power connectors, as it draws a lot of power. You'll need at least a 450W power supply to run it comfortably, although 500W or 550W is the preferred choice. Fortunately, the card isn't overly loud even under full load.

The price is likely to be the biggest restriction, though, and £470 is a lot to spend on a graphics card. If you have the money to spare, plus a suitably powerful PC and large monitor, you won't be disappointed. For those on a sensible budget, though, PowerColor's X1950 Pro is a better choice. While it doesn't support DirectX 10, it will be able to play new games for at least the next year.

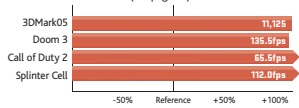
David Ludlow

SUMMARY

- ✓ Incredible performance
- ✓ Stream processors flexible
- ✗ Very expensive

GRAPHICS CARD Nvidia GeForce 8800 GTX, 575MHz core speed, 128 stream processors running at 1.35GHz, 768MB GDDR 3 memory running at 900MHz (1.8GHz effective), PCI-E x16, two DVI, TV-out
PART CODE 91-222G880X10-00
SUPPLIER www.scan.co.uk
DETAILS www.foxconnchannel.com

PERFORMANCE (see page 56)

ANTEC
P150

★★★★★

£102 inc VAT



Antec's iPod-white steel P150 case looks great on the desk and is built to keep your PC silent. It doesn't rattle, it has acoustic insulation and the hard disks screw into rubber grommets to prevent vibrations echoing through the P150. A silent Antec Neo HE 430W modular power supply is also included, all of which makes this case excellent value.



SILENT PC CASE ATX case, 120mm fan, two USB2, one FireWire, two audio ports, two 5¼" drive bays, one external 3½" drive bay, four internal 3½" drive bays **PART CODE** 0761345-019151-0 **SUPPLIER** www.morecomputers.com **DETAILS** www.antic.com Attractive; comes with power supply Drive bays hard to access **FULL REVIEW** Mar 2006

ECS
GeForce 6100SM-M

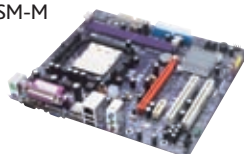
★★★★★

£40 inc VAT



ECS's GeForce 6100SM-M has onboard graphics, so it's perfect for building a PC on a budget if games aren't important. It's also microATX sized, so it will fit in a small case.

The GeForce 6100SM-M performed well in our benchmarks. It's a bargain if you want to build a budget AMD PC.



AMD MOTHERBOARD Socket AM2, Nvidia GeForce 6100S chipset, 2x DDR2 slots, 1x PCI-E x16 slot, 1x PCI-E x1, 2x PCI, 1x IDE port, 2x SATA II ports **PART CODE** 1493-0120 **SUPPLIER** www.pcnextday.co.uk **DETAILS** www.ecs.com.tw Cheap; good 2D and 3D performance PCI-E x16 slot runs at x8 speed **FULL REVIEW** Jan 2007

MSI
P965 Platinum

★★★★★

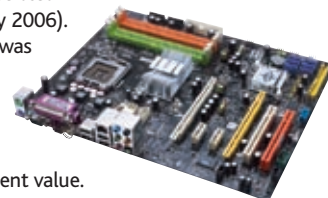
£102 inc VAT



If you want to build a Core 2 Duo PC, this motherboard is an excellent choice and was the cheapest to do so in our motherboard Labs test (*Shopper* January 2006).

Its performance was excellent in all our tests.

Considering the features it has, this is excellent value.



INTEL MOTHERBOARD Socket LGA775, Intel P965 chipset, four DDR2 slots, two PCI-E x16 slots, two PCI-E x1 slots, one IDE port, seven SATA2 ports **PART CODE** P965-Platinum **SUPPLIER** www.komplett.co.uk **DETAILS** www.msi.com.tw Good value; comprehensive BIOS **FULL REVIEW** Jan 2007

ASUS Vintage V2-AH2

★★★★★

£98 inc VAT

A barebones kit is probably the easiest way to build your own PC, as you get all the main components fitted inside a case. You just have to add a processor, memory, hard disk, optical drive and graphics card to get your own custom computer. Asus' Vintage V2-AH2 might not be the most attractive of cases, but it's affordable and packs in a motherboard that supports AMD's latest Socket AM2 processors.

The black and silver design of the mini-tower case won't be to everyone's liking, but there's a surprising amount of room inside. There's room for two optical drives, two external 3½" drives and a front flap neatly hides audio, FireWire and two USB2 ports. Inside the case there's room for a single hard disk, although you could use the external 3½" drive bays if you wanted to fit more disks. The motherboard uses Nvidia's C51PV chipset, which also has onboard GeForce 6150 graphics. This is the first motherboard and barebones system we've seen with built-in DVI and analogue outputs, so you can run two monitors from this one PC.

Graphics performance isn't very good and you can't play the latest 3D games. However, the GeForce 6150 is a cut above onboard Intel graphics, so you should be able to play older games or strategy titles, as these don't require as much 3D power. If you want to play games, the PCI-E x16 slot means you can install your own graphics card. The provided 300W power supply doesn't have a PCI-E connector, so you'll need a molex-to-PCI-E adaptor to install a card that needs external power.

The AM2 Socket supports AMD's latest range of processors, although we had to flash the BIOS before it would accept our Athlon 64 FX-62 processor. The V2-AH2 also supports the latest memory and you can fit up to 4GB of DDR2 800MHz memory in a dual-channel configuration using the four DIMM slots.

There's plenty of room for peripherals, with four SATA2 ports, which can be configured in a RAID array, two IDE ports and two PCI and one PCI-E x1 slots. The expansion cards are all held in place by a metal retainer. This is difficult to remove, and makes it hard to fit any expansion cards. The rear of the case houses the 5.1 analogue audio outputs (there are no digital



outputs), gigabit Ethernet, FireWire and four USB2 ports.

Installation of Windows is easy and Asus' driver CD has an install-all function, which installs all the necessary drivers in sequence, rebooting the PC in between each one. Unfortunately, the CD is bootable, so you either have to disable CD booting for an unattended install or be on hand to make sure this doesn't happen. Performance using our FX-62 processor and 1GB of DDR2 800MHz memory was very good and in line with other boards we've tested.

The Vintage V2-AH2 doesn't have everything we'd like to see, such as a digital output for the audio, and it's not the most attractive barebones case, but it's very good value and has onboard graphics. If you want to build a powerful but affordable new PC, this is a bargain.

David Ludlow

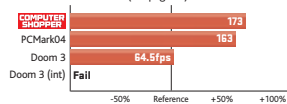
SUMMARY

- ✓ Surprisingly low price
- ✓ Lots of expansion options
- ✗ Ugly

BAREBONES SYSTEM Takes AMD Socket AM2 processors, four DIMM slots, four SATA2 ports, Gigabit Ethernet, eight USB2, two FireWire, 5.1 audio, PCI-E x16, PCI-E x1, three PCI, two 5¼" drive bay, three 3½" drive bays (two external, one internal)

PART CODE PCA-V2-AH2
SUPPLIER www.eclipsecomputers.com
DETAILS www.asus.com

PERFORMANCE (see page 58)



LEADTEK PX7900 GS TDH

★★★★★

£126 inc VAT

Leadtek's PX7900 GS TDH is the first graphics card we've seen to use Nvidia's GeForce 7900 GS graphics chip. It may seem like yet another card to fill out Nvidia's range, but it's more interesting than that.

If you look at the PX7900 GS's specifications – a core speed of 450MHz, 256MB of GDDR3 running at 660MHz (1.32GHz effective) and 20 pixel pipelines – they're remarkably similar to those of the 7900 GT. With two DVI outputs and TV-out (S-video and component), it also has the same excellent range of outputs. However, the PX7900 GS TDH has four fewer pixel pipelines. This is interesting to note, as cards that use the GeForce 7900

GT still cost more than £200, meaning that Leadtek's card is almost half the price.

The PX7900 GS TDH doesn't just have nearly identical specifications to the 7900 GT; it also has near-identical performance in all our graphics tests. Like the 7900 GT, it started to struggle at higher resolutions, scoring 24.7fps in our Call of Duty 2 test at 1,600x1,200. This isn't a big problem if you have a 17" or 19" monitor with a native resolution of 1,280x1,024 or you don't mind dropping detail settings.

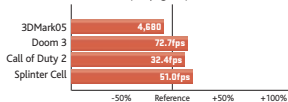
If you're after a mid-range Nvidia-based graphics card, Leadtek's PX7900GS TDH is the one to buy and makes the expensive GeForce 7900 GT

LEADTEK SUMMARY

- ✓ Excellent value
- ✓ Quick in games
- ✗ The X1950 Pro is quicker

GRAPHICS CARD Nvidia GeForce 7900 GS graphics chip, 20 pixel pipelines, 450MHz core speed, 256MB GDDR3 memory running at 660MHz (1.32GHz effective), PCI-E x16 interface, two DVI, TV-out
PART CODE PX7900GS-TDH256
SUPPLIER www.scan.co.uk
DETAILS www.leadtek.com

PERFORMANCE (see page 56)



redundant. If you're not interested in SLI and you just want a single graphics card, there's no need to limit yourself to Nvidia graphics cards. ATI's Radeon X1950 Pro offers similar performance to the excellent Radeon X1900 XT and costs just over £150.

For just £30 more than Leadtek's PX 7900 GS TDG, you can get PowerColor's X1950 Pro, reviewed on page 40. This is even quicker, and our recommended card for anyone looking for fast graphics on a reasonable budget.

David Ludlow